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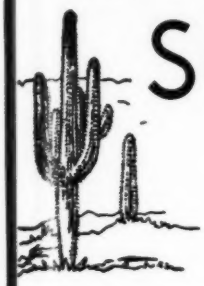

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Nutritional Enteritis

ALFRED C. REED, M. D.
San Francisco

THE most indispensable part of the digestive tube is the small intestine. Because of its relative inaccessibility it has received until recently much less detailed study than the proximal and distal portions of the tube. Its disorders may be divided clinically into acute and chronic groups. Acute disorders of the small intestine include chiefly acute infections, sudden obstructions and chemical irritation. Chronic disorders may be classified in general as neoplastic lesions; chronic infectious enteritis such as is seen in local tuberculosis and regional ileitis; anatomical irregularities as in the case of diverticula, polyps, bands and adhesions and congenital abnormalities; involvement of the small intestine in extra-intestinal disease; and finally, nutritional enteritis. This classification is modified from that of Weber.[1]

Nutritional enteritis in the past decade has accumulated a voluminous bibliography which is characterized by a minimum of theorizing as to etiology and synthesis, and by great repitition of a comparatively small group of data. Nutritional enteritis is a syndrome comprising a tendency to diarrhea, certain characteristic X-ray changes, and certain changes in absorptive function in the small intestine. The syndrome is frequently associated with redundancy and dialation of the colon, a mal-functioning gallbladder, and abstraction of calcium from the bones.

The X-ray changes consist of a smoothing out of the valvulae conniventes and what Kantor[2] well calls a "moulage effect". In this the appearance is that of a wax-lined tube. Segmented sausage-like clumps of barium are seen in dilated sections of the tube. The small intestine normally decreases in caliber from the duodenum to the lower ileum and the valvulae are most marked at the proximal jejunum, gradually disappearing in the lower half of the ileum. The X-ray signs of nutritional enteritis are therefore most prominent in the jejunum and upper half of the ileum. Serial films at intervals of 15 minutes after ingestion of barium are necessary to demonstrate these changes. Kantor[2] notes that the moulage tends to appear with exacerbations and disappear with remissions of symptoms, and therefore is prognostic as well as diagnostic. This fact also strongly suggests that the motor and mucosal pattern changes are functional or impermanent, and do not represent or (so far as known) lead to organic changes in the intestinal wall. It has been proposed by Snell and Camp[3] that the X-ray phenomena are caused by a diffuse inflamation of the mucosa with edema and infiltration. Mackie[4] in addition includes "a disorganization of motor function with reduction of activity and uncoordinated muscular contraction". Often associated with these X-ray findings in the small intestine, are redundancy and dilation of the colon.

In respect to absorptive malfunction, there is found a decreased or absent absorption of sugar, split fat, calcium (and to some degree phosphorus), and probably at times the fat-soluble vitamins A and D, and the anti-anemic principle. Lowered intestinal absorption decreases absorption of vitamin K as shown by a lengthened prothrombin clotting time.[11] But in apparent distinction from the other non-absorbed substances, vitamin K requires abundant presence of bile salts to make absoption possible. In the case of sugar and fats, absorption seems not to be increased by the presence of bile salts in

From Division of Preventative Medicine Medical School, University of California.

the upper small intestine, since Thaysen [11] found the bile salt quantity in the duodenal contents to be perfectly normal in sprue. Again, Starr and Gardener [9] found no decrease of fat excretion in sprue after oral administration of bile. Digestion is not impaired. Absorption is faulty.

Diarrhea is a predominant symptom constantly or at some stage. Apparently the X-ray findings are concomitant with the diarrhea. Apparenly also absorption does not improve in the presence of diarrhea but between diarrhea and mal-absorption it is impossible to say that one is cause and one effect. It is possible that the two are a vicious circle, and both result from an unknown cause. Bean and Spies [10] have discussed in detail the two-way relationship between vitamin deficiencies and diarrhea. The characteristic excess of split and neutral fats in the stool may therefore both cause diarrhea and result from it. When dietary fat is much in excess of absorptive power, the excess of fecal fat constitutes true steatorrhea and if continued and excessive, constitutes the syndrome named ideopathic steatorrhea.

DEFINITION AND COMMENT

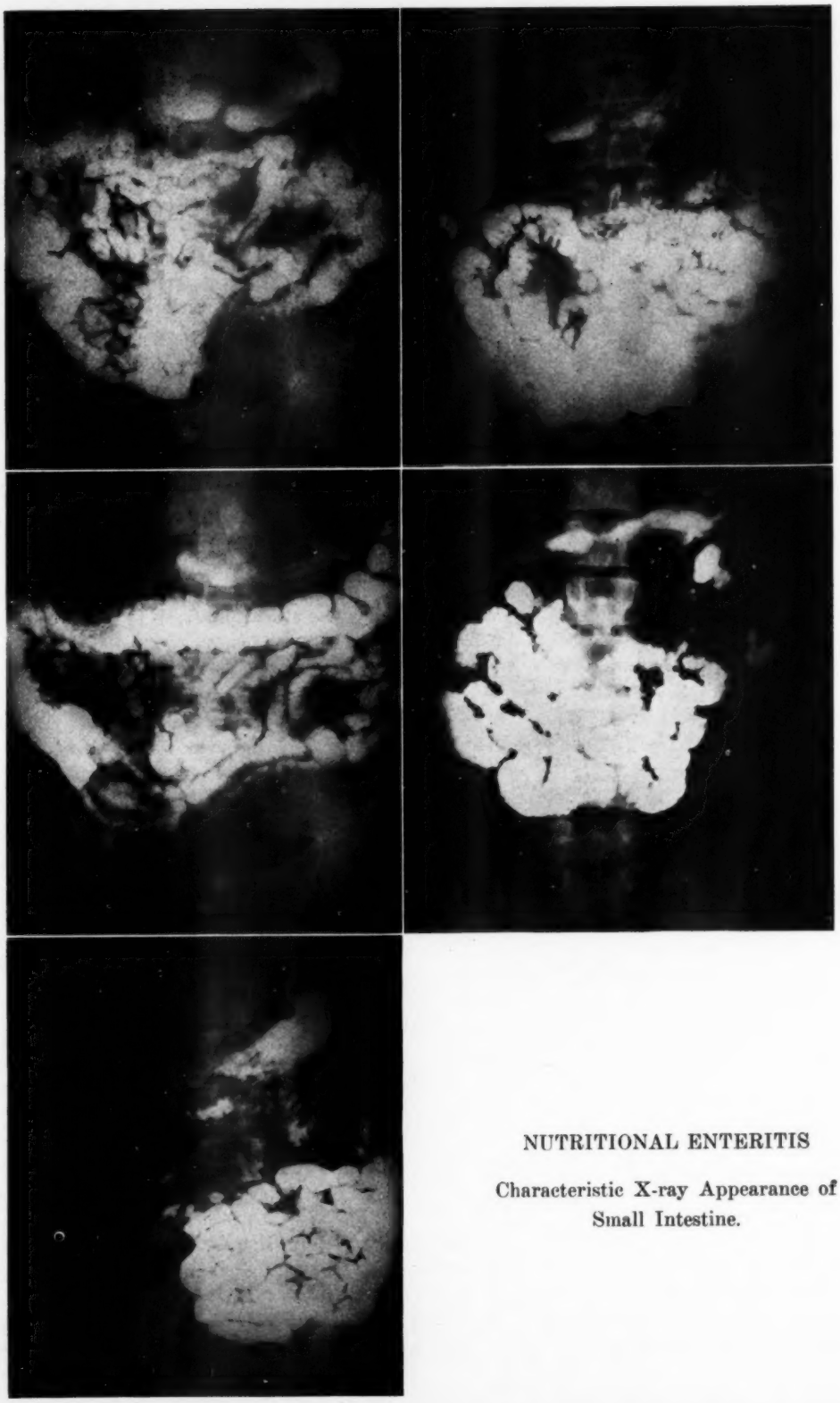
Nutritional enteritis is thus a syndrome characterized by certain X-ray signs, selective non-absorption and diarrhea. Its cause is unknown. If these symptoms are a result of mucosal edema, allergy must be considered as well as a nutritional deficiency. It may be a syndrome present in all diseases involving its specific unknown cause, or it may be a disease which has received different names according to relative intensity of symptoms, other organic pathologic associations or different conditioning by other related pathologic conditions. For instance, relative intensity of diarrhea with forced calcium loss might give a diagnosis of osteoporsis or osteomalacia, when calcium reservoirs in bone are depleted. Particular decrease of absorption of anti-anemic principle leads to accentuation of the blood picture of macrocytic, hyperchromic anemia. Associated deficiency of anterior pituitary secretion or of adrenal cortical secretion might increase the likeness to sprue. Secondary infection might precipitate the picture of chronic ulcerative colitis.

Nutritional enteritis is closely related to sprue, non-tropical sprue, chronic ulcerative colitis, Gee-Herter disease, chronic ideopathic steatorrhea, gastro-colic fistula symptomatoloby, lympho-sarcoma of intestine or mesenteric glands, osteomalacia, intestinal tetany, intestinal in fantilism, pellagra, chronic alcoholism, and som conditions of continued food deficiency.

Kantor [8] discusses the question of specificity of this syndrome. He states that available evidence indicates direct association with steatorrhae, which may be "idiopathic", or a result o a variety of organic diseases which interfere with the function of the intestinal lymphatics. Kantor refers to a personal communication from J. D. Camp, which suggests that conditions no usually considered to involve mal-absorption o fat, may also present this syndrome, such as pellagra, cancer of head of pancreas, chronic pancreatitis and "acute gastro-enteritis". In the present state of knowledge, Kantor believes that steatorrhea is the most common, if not the only condition associated with "moulage effect", and that for the present, moulage should suggest steatorhea.

The nervous element is prominent in many patients with nutritional enteritis who are prone to exhibit evidences of hysteria, anxiety, worry, introspection and the uncertainties of fear. Acute or intensified nervous stain frequently contributes to an exacerbation or even to the onset. Again, acute dysentery or gastro-enteritis may closely atedate onset of this syndrome. Bacteria, viruses and fungi may be the original excitants of symptoms, and, although it is extremely unlikely that they have any etiologic relationship, they may modify or condition the symptomatology. A special word is necessary in respect of the relationship to intestinal allergy. The prominence of a nervous or neurotic background, and the frequency of allergic history and symptoms, seem more than co-incidental.

Very little is known of the morbid anatomy of nutritional enteritis. A few post mortem reports in chronic idiopathic steatorrhea have been collected by Snell and Camp. [5] Whipple [6] reported in 1907 autopsy findings of extensive deposition of fat and fatty acids in the intestinal mucosa, in the mesentery and in recto-peritoneal lymph glands. Salvesen [7] reported in 1930 one autopsy showing atrophy of the pancreas and spleen with parenchymatous degeneration of the liver. Blumgart [4] in 1923 reported three autopsies of which two showed extensive deposition of fat in the intestinal mucosa, and adjacent lymph glands, with atrophy of the liver and spleen, and chylous ascites. The third case



NUTRITIONAL ENTERITIS

Characteristic X-ray Appearance of Small Intestine.

showed discrete ulcers of the ileum, with distention of the cecum and atrophy of the cecal mucosa. Deposits of fat were noted in the intestinal mucosa and also fat-loaded phagocytes of unknown origin. Starr and Gardner[9] in 1930 reported one autopsy showing atrophy, dilatation and passive congestion throughout the gastrointestinal tract. The mesenteric glands were hyperplastic and the spleen and pancreas were atrophied.

Autopsy reports in the sprue are more abundant and give a general picture of slow starvation and wasting.[11]

SUMMARY OF CASE HISTORIES

Eighteen cases are here reported in which nutritional enteritis played a prominent part. Analysis of these cases is a follows:

Sex. 10 male 8 female

Age. 20 - 30 = 3
31 - 40 = 6
41 - 50 = 4
51 - 60 = 3
60 + = 2

Duration of symptoms—1 month to 22 years.

IMMEDIATELY PRECEDING ILLNESSES:

Amebiasis	— 4	Bacillary Dysentery	—1
Neurosis	— 3	Flu	—1
None	— 3	Tuberculosis	—1
Migraine	— 1	Chronic arthritis	—1
Typhoid	— 1	Jaundice	—1
		Respiratory infection	—1

SYMPTOMS:

Loss of weight	—14	Nausea	—4
Asthenia	—14	Dysentery	—5
Abdominal pain	—11	Fever	—2 of 17
Flatulence	—11	Hypotension	—7
Diarrhea	—11	Examination negative	—8
Constipation	— 8		

LABORATORY DATA:

WASSERMANN and URINE normal in all.
Positive X-ray findings in small intestines—17.
Flat sugar tolerance curve—15 of 17 cases.
Anemia—6.
Leucocytosis—0.
Stools showed excess fat in 7 of 17 cases.
Stools showed blood in 3.
Lowered blood calcium in 3 out of 8 cases.
Basal metabolic rate—of 7 cases, 4 were normal, 2 below and 1 above normal.
Gastric analysis (alcohol meal):
Free HCl increased in 3
" " normal in 4
" " decreased in 7
" " absent in 2
" " not determined in 2

CONCOMITANT DIAGNOSES:

Anemia	6	
Allergy	6	
Clinical avitaminosis	5	
Neurosis	5	
Arterio-sclerotic heart disease	4	
Chronic ulcerative colitis	3	
Diverticulosis	3	
Simple colitis	3	
Chronic arthritis	3	
Achylia	2	
Prostrate congestion	2	of 10 males
Chronic ideopathic steatorrhea	1	
Non-tropical sprue	1	
Hypo-thyroidism	1	
Abdominal adhesions	1	

This review of 18 cases develops several striking points. Nutritional enteritis occurs with no evident relation to sex or age, and its symptoms may be recent or of many years' duration. In 4 patients it was immediately preceded by amebiasis, in 3 by neurosis, and in 3 it began with no prodromata. Its chief symptomatology consists of loss of weight, asthenia (often with hypotension), abdominal pain, flatulence, and diarrhea. In a few, constipation is outstanding, in more it alternates with diarrhea. Fever is uncommon. Nausea and dysentery are present in some. In 8 of 18 patients, physical examination was essentially negative.

Laboratory findings show that all but one had definite X-ray evidence of nutritional enteritis and all but two of these showed a flat blood sugar tolerance curve, suggesting deficient or absent absorption of sugar. The dextrose tolerance curve is not so reliable as the blood galactose tolerance curve, but the latter was not available until late in this series and for uniformity was not used. In only 7 of 17 cases was the fat content of the stools consistently increased. In 9 of 16 cases, gastric acidity was low or absent. In only 3 was it increased. In regard to concomitant diagnoses, 11 cases showed also allergy or neurosis. Clinical avitaminosis, seen in 5 cases, could have been related either to cause or effect. Otherwise the range of associated diagnoses is rather great and even unexpected.

SELECTED CASE ABSTRACTS

Case 1.—L. M., aet 68. Retired tailor. 4 months before entry, patient noted a tarry bowel movement, and subsequently dark red blood was seen several times. Constipation was constant. His only complaint was weakness. Sigmoidoscopic examination showed a reddened, easily bleeding musoca—no actual ulcers. A laparotomy was done in view of X-ray evidence of a narrowing at upper rectum and so far as the surgeon could determine, the bowel and adjacent parts were entirely normal. The same appearance by sigmoidoscope was present after operation and the same plastic contraction was seen by X-ray. The patient had a marked picture of nutritional enteritis in the small intestine X-rays, which disappeared in 2 months of treatment. It was concluded that he had a long-standing nutritional enteritis, with a very early or beginning chronic ulcerative colitis.

Case 3.—Mrs. M. L. Aet. 50. Housewife. The present illness began with flu in the epidemic

of 1918. She has had nearly continuous constipation, exhaustion and tachycardia. Abdominal pain, morning nausea, headaches and extreme flatulence completed a picture which has made her largely an invalid. Sugar, starches and milk upset her. Weight has remained normal. Examination was essentially normal.

Gastric analysis showed free HCl almost absent. There was secondary anemia, a flat blood sugar tolerance curve, ascorbic acid in blood 0.45 mg. %—average red cell diameter 7.65 microns and a color index of 1.0. The stool showed constant steatorrhea. Small intestine X-rays showed the characteristics of nutritional enteritis. Myocarditis and X-ray evidence of cholecystitis were present. The icteric index was 9.7. The clinical diagnosis was nutritional enteritis with steatorrhea and hypochlorhydria; nonspecific colitis; chronic arthritis; macrocytic anemia; avitaminosis; and allergy. Dietary regulation and a specific regime for these diagnoses led to steady improvement in all symptoms.

Case 4.—R. A. C. Aet. 54 Farmer. The present illness began 8 years ago with sharp epigastric pains and recurring severe diarrhea. The stool never showed blood. Fever was never present. The pains had gradually increased in severity and frequency, and were not related to eating. The patient has lost 25 lbs. in weight. The only other symptom was exhaustion.

Examination showed an average blood pressure of 96/72, pulse 66. Stomatitis and marked general arterio-sclerosis were present. Reflexes were reduced. There was deep tenderness above the naval and the prostrate was large and boggy. Sigmiodoscopic inspection to 9 inches showed a red, thickened, redundant mucosa with no ulcers, covered with thin gray mucus. The blood count was normal. No free acid appeared in gastric analysis. The blood sugar tolerance curve was as follows:

Fasting	95
I	165
II	149
III	108
IV	73

The X-rays were remarkable as shown by the conclusion, "The films show hypertrophic changes of the stomach and small bowel of the type associated with deficiency states. The changes are most marked in the stomach, with unusually well-defined hypertrophic changes in the rugae. The barium enema shows no changes in the colon."

The diagnosis was nutritional gastro-enteritis with achylia, arterio-sclerosis and prostatic congestion with hypertrophy.

Comment.—This is the first case of which we can find a record where the X-ray changes of nutritional enteritis extended through the stomach. The blood sugar tolerance curve is interesting in that it was intermediate, showing a fairly good dextrose absorption but ending with definite hypoglycemia.

Under dietary and associated therapy, the patient has made a notable improvement in weight and symptoms.

Case 12.—S. H. F. Aet. Housewife. Since spending 6 months in the orient 5 years ago, the patient has had repeated severe attacks of diarrhea, with low energy and at times profound exhaustion. Flatulence has been excessive. For years she has had extreme photophobia and nyctolopia.

Examination showed underweight, malnutrition and an average blood pressure of 102/66. The blood was normal, stools negative; blood NaCl was 463 mg. %, blood potassium 18.9 mg. %, blood calcium 7.8 mg. %. Gastro-intestinal X-rays as well as films of the long bones were normal. HCl was greatly reduced in the gastric samples. Blood sugar tolerance curve was flat, the figures being: fasting 90; ½ hour after ingestion of 100 g. dextrose 105; 1 hour after, 89; 2 hours after, 85.

Diagnosis.—Diarrhea was not present at the time of X-ray examination, resulting in the 1 case out of 18 which did not show the X-ray changes of nutritional enteritis. The history and flat sugar curve led to the conclusion that when diarrhea was active, the X-ray changes would be present. The sprue-like clinical picture was considered to include nutrition enteritis. A dietetic regime with specific attention to vitamins and calcium, brought striking and rapid improvement.

Case 13.—C. H. Male. Aet. Clerk. The *present illness* began 3 weeks before entry with languor, sensation of dopiness and of taking cold. After 3 days, he woke in the morning with severe abdominal colic and diarrhea. He has had no blood

or mucus in the stools, and no fever. Considerable weight loss and weakness were noted.

Examination showed only malnutrition, very dry skin, and a dry, pink, clean tongue. The *sigmoidoscopic* appearance was normal to 9 inches. *Laboratory data* were as follows. Blood count and gastric analysis entirely normal. Stools constantly showed a marked steatorrhea. *Sigmoid* cultures were negative for aerobic and anaerobic pathogens. Blood calcium 8.6 mg. %. Red cell diameter by eriometer 7.5 micra. *X-rays* of gastro-intestinal tract showed well-marked changes and moulage effect characteristic of chronic ideopathic steatorrhea. *X-rays* of bones were normal. The *diagnosis* was nutritional enteritis with steatorrhea.

Comment.—It is noteworthy that this patient was seen and diagnosed as chronic ideopathic steatorrhea just 3 weeks after a fairly abrupt onset of symptoms. A brother, 4 years older than patient, has had chronic ulcerative colitis for six years. Under appropriate treatment weight and strength increased and diarrhea was largely controlled.

Case 16.—C. S. Male. Aet. 28. Three years ago the patient had painless rectal bleeding with several small thrombosed external hemorrhoids, which were treated by D. Dudley Smith. Two years ago the condition recurred with blood and mucus in the stools. Proctoscopic examination showed many ulcers in lower four inches of the rectum, with a reddened easily bleeding mucosa between the ulcers. There was no pain, nausea, fever nor increase in bowel movements. His weight remained normal. X-ray with barium enema showed only an elongated colon. He was first seen by us on October 16, 1939, when diarrhea and constipation alternated—blood and mucus were constantly present in the stools and he had a low irregular fever. There was no nausea, pain or loss of weight.

Examination showed a tender, firm, easily palpable colon. The patient was worried, introspective, and had cold, cyanotic hands and feet. Blood pressure was 120/84, pulse rate 76, temperature in afternoons averaging 99.2 F. *Sigmoidoscopic examination* to 9 inches showed a red, granular, easily bleeding mucosa with some superficial excoriations. *Gastro-intestinal X-rays* showed no abnormality in any part of the gastro-intestinal tract. Serial films of the small intestine were entirely normal as was also the colon.

Gastric acidity was reduced, blood count was normal, stools showed excess of mucus, blood and pus, with no food elements. Mostly stool examination revealed an inflammatory exudate. Ascorbic acid in the blood was 1.2 mg. %; blood calcium 10.0 mg. %; fasting blood sugar 99 mg. %.

The *diagnosis* was set as chronic ulcerative colitis with hypoacidity.

The *further course*, under treatment, showed some remissions, but exacerbations of dysentery became more severe until finally he was hospitalized on August 19, 1940. At that time he was having severe rectal bleeding, intense pain, loss of weight, low fever, some nausea. Hemorrhoids were large and painful. Up to 9 inches, the sigmoidoscope revealed intense ulceration with red, bleeding mucosa between ulcers. Topical treatment by Dr. Dudley Smith gave relief from rectal pain. The blood count remained normal. The fever disappeared after 3 weeks of bed rest. There was decided improvement in the patient's appearance and feelings. His appetite returned but he did not gain weight. One month after hospitalization, X-rays were repeated. They showed characteristic changes in small intestine due to deficiency disease. X-rays with barium enema showed no spasm but rather extreme dilatation and redundancy, with no clear evidence of ulceration. The bowel walls were flexible and not tender. The X-ray findings were characteristic of nutritional enteritis and contrary to those of chronic ulcerative colitis.

Diagnosis and Comment.—Up to the last X-ray studies, the diagnosis of chronic ulcerative colitis seemed well-established. However, the redundant, dilated colon is characteristic of nutritional enteritis and the contrary of what is seen in ulcerative colitis. It seems probable that this patient has a type of pathology involving both diagnoses, since obviously neither can be excluded.

TREATMENT

The principles of treatment can be stated concisely. They are (1) to rest the over-taxed absorptive function of the small intestine. This means radical reduction of carbo-hydrate intake, and reduction of fats so far and so long as diarrhea is present. A high protein diet with abundant calcium, phosphorus, other minerals and vitamins is indicated. (2) The attempt to supply the unknown missing factors which may

possibly be found in or associated with the vitamine B_2 group.

Other treatment is symptomatic, and includes adequate physical rest and, very importantly, relief of anxiety, nervous tension and allergic symptoms. Concomitant conditions must receive appropriate special treatment.

CONCLUSIONS

1.—Nutritional enteritis is a syndrome well described in medical writings as consisting of functional changes in the small intestine, associated with characteristic changes in X-ray films and differential changes in absorbing power. The cause is unknown but is suspected to be a dietary deficiency.

2.—Eighteen cases are here reported, involving a wide range of concomitant diagnoses and exhibiting a great variety of symptoms.

3.—It seems important that routine serial X-rays of small intestine should be made a routine part of gastro-intestinal studies.

4.—Much observation and experiment will be necessary to establish the etiology but therapeutic problems in the concomitant diagnoses.

350 Post Street

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Bio-Physiological considerations in the Treatment of Sub-Capital Fractures of the Hip

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THE treatment of sub-capital fractures of the neck of the femur is a specially difficult problem, differing from that of all other fractures. It is the most unfavorable of all fractures as to union, so unfavorable that the title of an oration on this fracture before a recent Congress of The American College of Surgeons was designated as "The Unsolved Fracture."

Sir Ashley Cooper went on record 100 years ago with the statement that he had never seen a fracture of the neck of the femur that had united, nevertheless the profession in general has not, as yet, advanced materially in its concept of the fundamental requirements in the treatment of these fractures or the physio-biological considerations involved.

The British Fracture Commission has reported 22% of union in all types of treatment of central femoral neck fractures. In 1929 and 1930, a Committee of the American Orthopaedic Association studied this problem, and, from a general survey throughout the country found that certain clinics had obtained as low as only 30% of unions.

Two hospitals in New York have recently announced statistics showing 38% of union, while a third hospital reported 46%. A consideration of the greatest importance is that all three hospitals reported 20% of aseptic necrosis of the femoral head in those cases which came to union. The condition simulated osteoarthritis with flattening and mush-rooming, accompanied by symptoms so acute that in most cases arthrodesis of the joint was necessitated. When union is effected,—mechanical means alone being employed,—the question is still unsettled as to whether the blood-supply to the capital fragment is sufficient to avoid aseptic necrosis.

It would be difficult today to catalogue the numerous types of treatment recommended for fractures of the hip. From Sir Ashley Cooper's time to the present, all of the many varieties of treatment have been based upon mechanical replacement and fixation alone, without con-

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sideration for the bio-physiological requirements of the problem! These methods of treatment may be classified under two headings: The conservative, or non-operative, with no internal fixative agent, and the operative, with some internal fixation. In the former classification, one may mention the names of Whitman, Leadbetter, Maxwell Ruth and many others. The latter group can be enumerated according to the different applications of internal fixation or metal gadgets. One of these fixative agents recently reported by Dr. Morrison is extremely clever and ingenious. It consists of a bolt with an internal mechanism which, after insertion through a drill hole through the trochanter and neck into the head of the femur, allows the distal or internal end of the bolt to be opened like a small umbrella inside the capital fragments, thus insuring firm fixation into this fragment; the fragments are then firmly approximated by setting up the screw on the bolt at its proximal end. This meets the mechanical requirements of the treatment but not the bio-physiological.

LIGAMENTUM TERES

It has not been recognized that a sub-capital fracture of the hip is a different problem from that of other fractures and in failing to recognize this it has been assumed that mere reduction and maintenance of the fragments in position were all that was required. I have contended that this was not all, but that there were other factors entering into this particular fracture problem. The capsule of the hip joint is attached to the neck of the femur obliquely and close to the base of the neck; therefore, a sub-capital or central fracture of the neck of the femur is completely intra-articular. If it is completely intra-articular, then all possible sources of blood supply coming to the head fragment from the trochanter region of the femur, or distal to the joint are cut off by a sub-capital fracture; the only blood supply is through the ligamentum teres.

The question then arises as to whether the ligamentum teres does in all instances, when not torn, provide an adequate source of blood supply, or the tissue continuity for a circulation to develop in. Wolcott attempted to evaluate this by injecting the blood vessels of the ligamentum teres with mercury in cadaver specimens, and, in 15% of cases, could not find blood vessels of sufficient size to allow mercury to flow through them into the head of the femur, and Henderson, Chandler, and others, from similar research claim as high as 20%. The next consideration is the possibility of the ligamentum teres or its blood vessels being destroyed by the trauma producing the primary fracture, and in this regard, I wish to record some very interesting observations:

During the past twenty-five years, I have performed 447 arthroplasties either upon cases of aseptic necrosis of the femoral head, using fascia or vitallium cups, or for non-union with marked absorption of the femoral head and have in such cases removed the head of the femur as an item in my reconstruction operation. Some of these were during the period of my service in the First World War. A careful check was always made by myself and my associates of the condition of the ligamentum teres at the time of the operation and it was found that in 444 of these cases the continuity of the ligamentum teres had been previously destroyed and also that there was not the slightest evidence of bleeding at the cotyloid notch, where the ligamentum teres is inserted into the acetabulum. In over 70% of cases, all ligamentous tissue appeared to have been evulsed from the cotyloid notch,—in the remaining cases tabs of ligamentous tissue were found attached to the cotyloid notch of the acetabulum and fovea of the head of the femur or both. In three cases, the ligamentum teres was found intact and it was found necessary in all of these to sever the ligament before the femoral head could be removed. Free bleeding was observed at the cut end of its proximal portion. In one of these the fracture was found to be at the center of the neck and due to a rifle bullet which was discovered at operation between the un-united fragments.

The thought occurs to one in this case that inasmuch as the neck of the femur was severed by a bullet, it may at the time of severing the femoral neck have produced shock sufficient to result in muscle flaccidity and because of this, muscle spasm incident to the usual fracture did not occur and force the distal fragment of the femur upward, thus rotating the head in the acetabulum upward on the outside and the fovea of the head downward on the inside, to such a degree as to tear or evulse the ligamentum teres. This assumption is strengthened by the fact that the capsule is loose and

alone determines the extremes of motion of the joint when the bony framework of the joint is intact and would not interfere with this degree of rotation of the femoral head fragment.

It is believed that the rotation of the head which tears the ligamentum teres is brought about by the concerted spasmodic contraction of two powerful group of muscles at the time of fracture, viz: while the inward and outward rotators and abductors of the hip pull mesially upon their osseous insertion (the great trochanter) holding the fracture surfaces of both capital and distal fracture fragments together somewhat like the cogs of cogwheels, the more powerful muscles of the thigh force the distal femoral fragment upward, thus rotating the fracture end of the spherical capital fragment upward, and the fovea side of this head fragment downward,—in this way tearing or evulsing the ligamentum teres. The displacing influence of the same forces which produced the fracture may also aid in this phenomenon and then the very weak ligamentum teres gives way.

Dr. Gwilym G. Davis[3] may be quoted in this connection:

> "The ligamentum teres is composed of synovial and connective tissue. It is not strong and ruptures at about 14 kilos (30 pounds): the small artery it contains affords nourishment for itself alone, only a very small amount of blood going to the head of the femur. Bland Sutton regards it as a vestigial structure and a regression of the pectineus muscle. It is too weak to add much to the strength of the joint, and the view of Allis that its function is to distribute the synovial fluid and act as a lubricating agent is probably correct. The great pressure to which the articular surfaces of the hip joint are subjected requires special lubrication and this is furnished by the ligamentum teres and Haversian gland."

From these studies, it is deduced that in the 447 cases of sub-capital fracture, the weak ligamentum teres was destroyed by torsion rotation or avulsion incident to the explosive displacement at the time of fracture. After many months, or, as is often the case, many years, it is difficult to deduce accurately the circumstances associated with the destruction of the ligamentum teres, or the precise place where it gave way. Varying degrees of fibrous adhesions to the periphery of the head are sometimes found, but when severed in removing the head, they have rarely been found to bleed to any appreciable extent, thus indicating that an adequate source of blood supply has not reached the capital fragment via this route.

If the ligamentum teres has not been ruptured, its continuity should serve to conduct induced collateral blood circulation of uncertain amount to the capital fragment, even if anatomically, the blood vessels were very meager.

It is my firm belief that in those cases coming to non-union, the destruction of the ligamentum teres at the time of the fracture is the important determining factor in the prevention of union. In other words, one is justified in coming to the conclusion that when the ligamentum teres is destroyed, the capital fragment becomes practically a joint mouse. Because of the intervening joint cavity, no collateral blood supply can come to it as in the case of other fractures from adherent overlying muscles or soft parts, and also as an added obstacle to union, the synovial fluid extends between the fracture surfaces of the femoral fragments, completely bathing these surfaces. This must act as a real barrier preventing granulation tissue or callus extending from one fracture surface to the other, thus influencing inhibition of the very beginning of the attempted union.

IMPACTION AND OTHER FACTORS

It can be further deduced that it is only in central or sub-capital fractures that the mechanics are such that the spherical shaped capital fragment is permitted to rotate under the superior edge or roof of the acetabulum. When primary impaction occurs, there can be no rotation or twisting of the head; therefore, the ligamentum teres does not become torn or evulsed. This undoubtedly is one of the principal reasons, if not the determining reason, why such fractures are much more favorable to union. By the same token, it does not follow that secondary artificial impaction by the surgeon is of the same value because rupture of the ligamentum teres and surrounding peri-osseous soft structures may have already taken place by the primary rotation of the head fragment. When the fracture occurs further out in the neck of the femur, especially when it is transtrochanteric, the capital fragment is so long that it cannot become rotated, under the rim of the acetabulum. Therefore, the ligamentum teres

does not suffer. Also, if the fracture is so far out that it is partly or completely extra-articular, the adherent soft parts to the distal end of the capital fragment will prevent its rotation to such a degree as to rupture the ligamentum teres, and they will also serve to convey blood vessels to the fracture junction of both fragments. There is thus a double reason for the statement so frequently made that transtrochanteric fractures always unite, whereas the prognosis is poor in sub-capital fractures treated by mechanical fixation alone.

Some years ago, both Dr. Willis C. Campbell and I published statistics of results of the application of tibial bone-graft peg in un-united sub-capital fractures of the neck of the femur showing 94% successful results. The significance of these results is important inasmuch as Dr. Campbell and I were dealing with cases in which the fundamental indications were the same as in fresh fractures but much more unfavorable; firstly, because they were pseudo-arthroses; secondly, the capital fragment had become practically a joint mouse, and thirdly, the urge of primary repair had long ceased to exist.

By chance, through a fault of technic on my part in failing to approximate or impact the fragments in three of these cases, we were unexpectedly able to learn of the unusual potentiality in a situation in which under any other type of treatment it would have meant failure. The hiatus between the fragments in these cases varied in extent from one-half to two-thirds of an inch and was spanned within the joint by the bone-peg alone. Post-operative x-ray studies of these cases made periodically showed that the peg constantly increased in size to the degree that it finally filled in the hiatus completely, and this in spite of the fact that the fragments were separated and the peg situated in the joint cavity surrounded by synovial fluid, blood vessels extending through it from the trochanter fragment to the capital fragment, the peg by its inherent osteogenesis having filled this space between the fragments with resultant union. The importance of this observation is self-evident as showing the potentiality of the bone-graft under most unfavorable conditions. It might well be asked what would have happened had a metal agent been used? In this respect, however, it should be commented that in many instances in varying environments, the author has observed that a graft has filled in spaces many times more extensive than in the cases cited,—even as to as much as sixteen times the dimension of the hiatus in any one of the cases. —the only difference being that the longer grafts were surrounded by vascular conducting soft tissues instead of spanning a joint space filled with synovial fluid.

BONE GRAFTING

Bone, being a supportive and relatively undifferentiated tissue, is able to suffer the absence of its blood supply for a considerable time without adverse effects; for this, among other reasons, it is extremely favorable for transplantation. The rapid and profuse vascularization of a bone graft is one of the most striking features encountered. When a portion of the complete diameter of a long skeletal bone has been replaced by massive grafts of much smaller diameter, the whole shaft will be restored not only to its complete diameter and strength, but will also develop a completely vascularized marrow cavity. The same phenomenon occurs in the use of a bone graft as a terminal structure such as in building digits where a tibial bone graft is inserted into a tubular skin graft to restore a finger or thumb w'ich the author has successfully done many times. In this instance, there is a physio-biological demand for blood at the distal end of this bone graft and in response a collateral circulation is developed throughout the whole length of the graft to the degree of a marrow cavity with its incident blood vessels. The analogy is identical to that of the peg graft conveying blood to the anemic femoral head from the very vascular cancellous tissue of the trochanter. These characteristics, as well as the osteogenetic capacity of the autogenous bone-graft peg together with its mechanical strength determines it to be the ideal means of treatment in operable cases of both fresh and un-united fractures of the central intra-articular portion of the neck of the femur. It is the only answer to the tripod of necessity in the treatment of such fractures, for it, first, furnishes efficient immobilization and secondly, a living scaffold for conveying vascularization to the anemic head-fragment, and thirdly, it brings an osteogenetic, callus-forming influence to the fracture junction.

To show the unusual vascularization capability of a bone-graft, Sir Arthur Keith, the fa-

mous practical pathologist of England, has prepared at the Museum of the Royal College of Surgeons in London, an extensive number of specimens. These specimens are prepared and injected and show the early and profuse vascularization of bone grafts when used for a variety of purposes. In restoring extensive lost portions of shafts of bone, and in a multitude of other uses, as well as in animal research, my own experience has in every instance confirmed Sir Arthur's findings.

It is, however, of great importance in cases where other types of treatment have been employed, especially the various kinds if metal fixation agents for the surgeon to be eternally vigilant in watching for the earliest evidence of the beginning of non-union. If there should be any change of position in relation to fragment to fragment or failure of callus formation of absorption of bone around the metal, even of the slightest degree, as shown in good x-rays, this is evidence that union is not taking place. Very soon proof will follow with bone absorption at the neck of the fracture junction, indicating that there is an inadequate blood supply and that the ligamentum teres has been ruptured or destroyed by rotation of the head at the time of the fracture. Under such conditions, if bone absorption is to be avoided and union is to be secured, immediate action is urgent. With the fragments in good position, a bone-graft peg of at least one-half inch in diameter should be immediately inserted.

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Effect of Electromagnetic Radiation on Flocculation Tests For Syphlis

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I THE EFFECT OF ULTRAVIOLET RAYS

ACCORDING to Eagle[1], it has not been possible to induce a true positive Wassermann test in originally negative human sera by simple physical or mechanical manipulation such as shaking, or treatment with chemical substances such as ether. He goes on to state that "highly significant is the fact that these treated sera are consistently flocculation negative, a fact which is incompatible with the supposed creation of reagin by the physical or chemical manipulation". Eagle explains the supposed change in reactivity by a systematic technical error.

These experiments were undertaken in an effort to explain the mechanism of the flocculation reaction and changes brought about by irradiation with ultraviolet rays.

Experimental

The Kline diagnostic, Mazzini and Leiboff tests were employed in our experiments, and strict care was observed in following the author's directions in every detail. The source of light was a "Bristow" Cold Ray Quartz Mercury lamp. The output of the lamp as given by the manufacturer is: 89% between 2000 and 2600 A°, 10% 2600-3000 A°, and 1% 3000- 3200 A°.

All sera were heated for 30 minutes in an electrically controlled water bath at 56°C., removed, cooled and run by the three mentioned tests. The reactions so obtained constituted the control or the non-irradiated reaction of the sera. The sera were then measured onto the glass place, the antigen added, and shaken under the ultraviolet ray light for four minutes. The standard distance for the lamp was 24 inches above the samples. The results obtained with 350 sera using the Kline diagnostic test alone are shown in Table I.

Table I
Syphilis—350 sera.
Effect of Ultraviolet Ray Light on Kline Diagnostic Test for Reaction

Before Irradiation	No. of Sera	Irradiated Reaction Numbers					
		—	±	1+	2+	3+	4+
—	244	27	24	95	66	11	1
1+	15	0	0	0	2	7	6
2+	35	0	0	0	1	11	23
3+	31	0	0	0	0	2	29
4+	45	0	0	0	0	0	45
Total	350						

Table II shows the results of 350 sera using the Kline diagnostic Mazzini and Lieboff tests.

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There was complete agreement in these three tests in every case.

Table II

Effect of Ultraviolet Ray Light on Kline, Mazzini and Leiboff Tests for Syphilis (350) sera) (complete agreement)

Before Irradiation	No. of Sera	Irradiated Reaction Numbers					
		—	+	1+	2+	3+	4+
—	241	20	22	143	48	8	0
1+	3	0	0	0	0	2	1
2+	31	0	0	0	1	5	25
3+	30	0	0	0	0	2	28
4+	45	0	0	0	0	0	45
Total	350						

In each case listed in Table I and Table II, another portion of sera alone was irradiated for four minutes, and then antigen added, then the mixture of antigen and serum shaken for an additional four minutes following standard procedure. No change from the control was noted in any case. Antigen alone was irradiated for four minutes under the lamp and no agglutination was observed microscopically. When the antigen and serum were irradiated separately for four minutes, then mixed and shaken for four minutes, no rise in titre was noted in any of the 700 sera examined.

The distance of 24 inches was chosen as the desired distance after it was found that this distance gave the optimum effect of the light on four minute exposures. As the light was withdrawn its effect became less, until finally, at 48 inches there was no change in the sera. In order to ascertain that the violet rays were the effective spectra, a series of 24 sera were set up and standard Kline antigen added. A pane of window glass was then placed over these and they were shaken under the violet ray lamp for four minutes. The results showed no change from the non-irradiated sera, which would indicate that the rays between the 2000 and 3000 A° range were effective in bringing about the results obtained in Tables I and II.

Warren[3] has shown that the gold curve of normal spinal fluid is not affected by irradiation even after 60 minutes exposure. However, when spinal fluids giving paretic curves were irradiated, the amount of gold precipitated was decreased in the highest concentrations. Likewise, fluids from syphilitic gold curves, after irradiation, showed a decreased precipitation in the middle dilutions and increased precipitations in the highest concentrations. In an effort to confirm Warren's work, using sera rather than spinal fluid, a series of 150 sera, ranging in reactions from negative to 4+, were poured into small petri dishes so that the depth would not be over 3 m.m. and placed under the lamp for intervals of 60, 90 and 100 minutes, with occasional stirrings. At the three time intervals samples were withdrawn and Kline diagnostic tests performed. It was found that the majority of the specimens became negative at the end of 60 minutes, but a few required as long as 100 minutes to become "optically negative" as shown in Table III.

Table III

Time Required to Cause Sera to Become Negative By Irradiation

Control Reaction	Total Sera Examined	60 min.	90 min.	100 min.
—	50	50	0	0
1+	7	7	0	0
2+	22	22	0	0
3+	29	24	0	0
4+	42	27	11	4

These "Optically negative" sera were then transferred to glass slides, Standard Kline antigen added, and the mixture shaken under the ultraviolet ray light at 24 inches for four minutes. The results are given in Table IV which closely approximates those obtained on the sera represented in Tables I and II.

Temperature readings were made for a thermometer placed on the desk next to the petri dishes containing the sera and another one was placed in the room out from under the light. From the time the experiment started to the time of completion, a time interval of 100 minutes, there was only a temperature increase of 0.5° C. produced by the ultraviolet ray lamp.

Brooks[4], Heuer[5] and Levine[6] all have noted the destruction of complement by the action of ultraviolet rays. However, Levine states that the reaction is not spontaneously reversible.

Table IV

Effect of Irradiating Optically Negative Sera—Immediately at End of Exposure

Non-Irradiated Reactions	No. of Sera	Irradiated Reaction Numbers					
		—	+	1+	2+	3+	4+
—	50	0	3	31	14	2	0
1+	7	0	0	1	3	2	1
2+	22	0	0	1	2	4	15
3+	29	0	0	0	3	1	25
4+	42	0	0	2	1	0	39

The "Optically negative" sera which were previously treated as shown in Table III were poured into small test tubes, corked and placed in the ice box. At intervals of 4, 6, 12, 15, 18, 24 and 48 hours the samples from a series of ten were warmed up to 56° C. for ten minutes and Standard Kline diagnostic tests performed. The results are given in Table V. It was found that at the end of 24 hours the sera reached its highest degree of positivity, for the reading at 48 hours showed no further increase in titre. A

series of 24 optically negative sera were stored at room temperature and examined at intervals of 12, 18, 24 and 48 hours with identical results as those stored at ice box temperatures.

Table V

Regeneration of Optically Negative Sera

No.	Non-Irradiated Reaction of Sera	Reaction After Prolonged Irradiation	Time in hours 4	6	12	15	18	24	48
1	2+	—	+	+	1+	2+	2+	2+	2+
2	2+	—	+	1+	1+	2+	2+	2+	2+
3	2+	—	—	+	1+	2+	2+	2+	2+
5	3+	—	—	+	2+	2+	2+	3+	3+
4	3+	—	1+	+	2+	2+	2+	3+	3+
6	4+	—	.....	1+	2+	2+	2+	3+	3+
7	4+	—	.....	1+	2+	2+	3+	3+	3+
8	4+	—	.....	1+	2+	2+	3+	3+	4+
9	.....	—	.....	.....	.....	.....	.....	.....	.....
10	.....	—	.....	.....	.....	.....	.....	—	—

Table VI gives the results of regeneration on the same series of 150 sera which is shown in Table IV.

Table VI

Regeneration of Optically Negative Sera After 24 Hours

Non-Irradiated Reactions	No. of Sera	—	+	1+	2+	3+	4+
.....	50	50	0	0	0	0	0
1+	7	0	0	7	0	0	0
2+	22	0	0	4	18	0	0
3+	29	0	0	4	16	9	0
4+	42	0	0	2	24	9	7

In order to determine the time element in exposure to the ultraviolet ray, a series of 100 sera was mixed with antigen and shaken at varying intervals of time, first under the light and then in normal daylight. It was found that a 30 second exposure caused a few negative sera to show positive tests, and raised the reactivity of the positive sera. An exposure of three minutes was found to be the optimum time since further exposure had no effect on the reactivity of the sera. On the other hand, when the mixture of antigen and serum was shaken for one minute in normal light and for three minutes under the lamp, no change from the control was noted, nor was there a change when a 2-2 minute or 3-1 minute ration was used.

DISCUSSION

Explanation of the observations made in these experiments can be only a hypothesis, as no definite answer is readily available. Clark[3] has made the interesting observation that a pH of 73 serum albumin carries a negative charge which, upon irradiation with a quartz mercury lamp, becomes positively charged. Globulin, on the other hand, according to Mond undergoes no change on irradiation but becomes more stable. This change in charge observed by Clark may affect the clocculation tests for syphilis, and could be the explanation of the decrease in titre of the positive sera on prolonged exposure. It does not, however, explain why the negative sera becomes positive on short exposure, nor why the positive sera increase in positivity. Likewise, this may offer an explanation for the inactivation of positive sera, but it does not offer a satisfactory answer as to why the "Optically negative" sera become regenerated upon standing 24 hours. The change in electrical charge might well be the reason for the results obtained when a specimen was shaken for a time interval under the light and for a time interval in normal light, but it does not offer a completely satisfactory answer to any of these questions.

The nature of the changes described in this paper are not as clear as may be desired. Since sero-negative serum was rendered sera-positive, and the reactivity of the sero-positive sera was increased it would tend to indicate that there was some substance normally present in nonluetic serum that was reacting with the antigen, and that was "activated" by the rays from the lamp. Assuming this to be true the results obtained in these experiments could be explained.

The results of shaking antigen-serum mixtures under the lamp for one minute and in normal light for three minutes, under the lamp for two minutes and in normal light for two minutes, and under the lamp for three minutes and in normal light for one minute, thus producing positive reactions in negative sera, then reversing the above process without producing any changes, would fit well with the hypothesis offered. In the first case the antigen and optically active substance react under the influence of the lamp giving floccules. In the second case the antigen reacts with optically active substance producing a stable compound upon which the light will not react, thus no floccules are produced.

The above explanation is given purely as an hypothesis and is no attempt at a definite answer to the phenomenon. The exact explanation will require much more study and a great many more experiments.

Experiments upon the specific rotation produced by irradiation and effects of absorption are now under way and it is hoped that more definite explanation of the phenomenon will be available.

CONCLUSIONS

1. Sero-negative serum in the presence of antigen was rendered sero-positive to the Kline,

Mazzini and Leiboff tests by the action of ultraviolet light.

2. Positive sera increased in reactivity when mixed with antigen and rotated under ultraviolet ray light.

3. Serum irradiated without antigen gave no increase in reactivity.

4. Positive sera became "optically negative" on prolonged exposure to the rays of the lamp.

5. The "Optically negative" sera, when shaken with antigen under the lamp, reacted the same as non-irradiated serum did to the treatment.

6. The "Optically negative" serum became regenerated after 24 hours and gave positive reactions.

7. Serum and antigen mixtures, when shaken first under the lamp and then in normal light, increased in reactivity. When the process was reversed, and the serum shaken in normal light for one minute and under the lamp for three minutes, the serum showed no increase in completeness of reaction.

EXPERIMENTAL

The Kline diagnostic, Mazzini and Leiboff tests were used as slide tests, and the Kahn standard and Hinton used as tube tests throughout these experiments. Strict care was observed in following the author-sorologist's directions in every detail in performing each test. The source of the 12 miter waves was a "Bristow" model F-12 portable diathermy with 24,000,000 oscillations per second. The wave length of the machine was checked and found to fluctuate between 11.5 M. and 12.5 M. over a period of 30 minutes.

All sera were heated in an electrically controlled water bath at 56°C. and 30 minutes, removed, cooled and examined by the various tests. The results so obtained constituted the control reaction. The sera were then measured onto a glass slide, the antigen added and the plate placed inside a petri dish to prevent any possible evaporation. The petri dish was then placed on a small wooden rack so that the two contact plates of the diathermy would be just 2.5 inches on either side of the serum-antigen mix. The rack was then rotated for a period of four minutes with the amperage of the diathermy set at 1500 milliamps. In order to be sure that any changes obtained were not due to any heating effect of the diathermy, an electric fan was placed behind the rack and a stream of air passed over the petri dishes. To further check the heating effect of the waves, a small tube of serum was fitted with a cork through which a thermometer was inserted. A change in temperature of from 24°C. to 26°C. was noted after an exposure time of 30 minutes. The Hinton and Kahn tests were run according to standard methods, except that during the shaking period one terminal was placed on either end of the wooden rack and the amperage on the diathermy set at 1500 milliamps. All of the Hinton tests were run by the rapid method.

A series of 30 sera were run using machines of various wave lengths. The results obtained are given in Table VII.

Table VII
Comparison of the Effects of Various Wave Lengths
Four Minute Exposure*

Control Reaction	Wave Length in Meters: Six	Twelve	Eighteen	Twenty-four
—	—	—	—	—
1+	+	+	+	+
2+	1+	1+	1+	1+
3+	1+	1+	1+	1+
4+	2+	2+	2+	2+
Twenty-Five Minutes Exposure				
—	+	+	+	+
1+	1+	1+	1+	1+
2+	2+	2+	2+	2+
3+	3+	3+	3+	3+
4+	4+	4+	4+	4+

* Results of Kline, Mazzini, Leiboff and Kahn tests. Hinton tests all negative at four minutes and at end of 25 minutes all positive, except the sera that were originally negative which remained negative.

An examination of Table VII will indicate that within the band range tested, 6-24 M., the change in wave length had no effect on the end result.

A second series of 30 sera were examined using the Kline standard test and varying the distance of the contact plates. It was found that the optimum effect was obtained when the plates were at a distance of 2.5 inches from the serum antigen mixture, and gradually decreased as they were moved away until, finally, at 15 inches (30 inch spread) their effect was no longer shown.

Four minutes was taken as the initial time of exposure as that is the standard shaking time of all the tests used. Unlike the effects obtained with ultraviolet rays, a shorter exposure did not influence the reaction. A series was run using various times below four minutes in the active field of the diathermy, and the remaining time outside the active field; the results obtained were the same as the control reactions. However, if the serum-antigen mix was allowed to remain in the active field for a longer period,

an increase in titre over the four minutes reading was obtained. This phenomenon was at its highest peak at the end of 25 minutes; any longer exposure did not increase the positivity of the serum.

Table VIII

Effect of Time of Exposure of Diathermy Upon Positivity Of Serum—Kline Test

Reaction Before Exposure	Time in Minutes					
	Four	Ten	Fifteen	Twenty	Twenty-Five	Thirty
—	—	—	—	—	—	—
1+	+	+	1+	1+	1+	1+
2+	1+	1+	1+	1+	2+	2+
3+	1+	2+	2+	3+	3+	3+
4+	1+	2+	2+	3+	3+	3+

When serum alone was placed in the active field of the diathermy for periods of 4, 10, 15, 20, and 25 minutes and then run by the various tests, no change in titre was noted. Likewise, when the antigen was treated alone and then added to the serum, no change was produced. This effect was the same as that shown by the ultraviolet rays; a change in titre was observed only when the antigen and serum were mixed and the mixture placed in the active field of the waves.

A total of six hundred sera were examined during the course of these experiments. All five tests were run on each sample. The results obtained using the Kline, Mazzini, Leiboff and Kahn tests are shown in Table IX.

Table IX

The Effect of Shortwave Diathermy on Kline, Mazzini, Leiboff And Kahn Tests for Syphilis

(Complete agreement 600 sera)

Reaction Before Exposure		Reaction after exposure (numbers)											
		Negative		+		1+		2+		3+		4+	
	No. Tested	5 Min	25 Min	5 Min	25 Min	5 Min	25 Min	5 Min	25 Min	5 Min	25 Min	5 Min	25 Min
—	108	108	61	0	31	0	0	0	16	0	0	0	0
1+	25	21	1	3	2	1	15	0	6	0	1	0	
2+	140	54	0	16	0	60	23	10	77	0	27	0	13
3+	173	45	0	8	0	78	5	36	58	6	69	0	41
4+	154	12	0	3	0	44	0	65	11	26	53	7	90
Total	600												

The results of the Hinton tests are shown in Table X.

Table X

The Effect of Short Wave Diathermy on the Hinton Tests for Syphilis

600 Sera tested

Reaction before Exposure		No. Tested	Hinton reaction after exposure					
			Negative		Doubtful		Positive	
Kline	Hinton		5 Min	25 Min	5 Min	25 Min	5 Min	25 Min
—	—	108	108	55	0	53	0	0
1+	+	25	25	0	0	0	0	25
2+	1+	140	140	0	0	0	0	140
3+	1+	173	173	0	0	0	0	173
4+	1+	154	154	0	0	0	0	154
Total		600	600	55	0	53	0	492

DISCUSSION

The effects obtained using the short wave diathermy were just the opposite of those obtained by using the ultraviolet ray. There was definitely a retarding of the reaction between the antigen and the serum at the shorter exposure time. This may be due to the fact that the diathermy waves prevented the lyphobic particles from coming out of suspension, or, on the other hand, the reaction between the two components may have been slowed down to such an extent that a longer time was necessary for the reaction to become complete.

A definite answer or explanation to the phenomenon is not readily available and will come only after a great deal more work has been done on the problem. However, the results obtained would tend to indicate that we are dealing with some substance other than the syphilitic antibody, or the so called "reagin." It would seem rather, that constituent of the blood serum has merely increased.

CONCLUSIONS

1. Positive sera becomes less positive on short exposure and more positive on long exposure in the presence of antigen and diathermy short waves.

2. Diathermy short waves do not affect the serum alone or antigen alone. The effect is observed only when the antigen and serum are mixed and the mix rotated in the active field of the waves.

3. The effects obtained by use of diathermy short waves were just the reverse of those obtained with ultraviolet rays.

University of Arizona.

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Be In EL PASO

Nov. 19-20-21-22!

Attend Annual Meetings of

Southwestern Medical Association

Southwestern Academy
Eye, Ear, Nose and Throat

Southwestern Chapter,
American College of Chest Physicians

Responsibility of The Medical Profession in The National Emergency

LT. COLONEL JOHN DIDDLE
Medical Corps, U. S. Army
Fort Sam Houston, Texas

Dr. Mulky, honored guests, and members of the New Mexico State Medical Society. Colonel Hart has asked me to express to you his regrets that he is unable to appear on your program. As his substitute I trust that I may be able to do justice to a subject which we consider to be of so great importance to you as individuals and responsible citizens.

The title for this paper, as announced by the chairman, was changed from "The Medical Reserve Corps" to "The Responsibility of the Medical Profession in the National Emergency," at Colonel Hart's specific request because we feel that in the circumstances of modern warfare or national armament the needs of the military service per se, as typified by the Medical Reserve Corps, are in some degree subordinate to the problem of medical service for the nation as a whole. This problem involves organized medicine, the co-ordinated effort of the medical profession as represented by this society, united for the common welfare of the state and nation. It therefore seems particularly appropriate that your group should give consideration to its responsibility so early in its annual meeting.

—The Author.

ALL of you have given some thought as to what the future may hold for you as individuals living amid the present disordered state of world affairs. You may or may not have considered this problem in the light of your responsibility as a member of an important professional group vital in national defense. herefore, as a basis for consideration I will present this as a problem and ask you, "What is the Responsibility of the Medical Profession in the National Emergency?"

First let us look into the nature of the emergency. We find ourselves, a nation which for over one hundred and sixty years has existed independently with the basic ideals that all men are born free and equal, that they have a right to enjoy life, liberty and pursuit of happiness, that they have a right to free speech and to a free government of their own unintimidated choosing—we find such a nation confronted with another idealogy which says that this is all wrong, which says that some were created to rule but most to serve, that man is the creature of the state, that might makes right, that only the ruthless can lead and that all others must follow in thought, word, and deed. Since the beginning of our history nations with such opposing ideas have existed side by side, not always in peace, but at least content to let each sovereign state choose which course of government it desired to follow. Not so today. Now we find the great exponent of power not only declaring that the two doctrines of government, democracy and absolutism, cannot exist together in the modern world, but also attempting by ruthless war and brutal force to see that his is the triumphant system. In the fact of this threat there is open to us only one course of action if we would preserve our cherished freedom. We must arm, arm as we have never armed before and be prepared to meet force with force. The responsibility for this armament falls on every individual, group and class. The responsibility of the medical profession is especially great, the nature of this responsibility will bear analysis.

MISSION OF MEDICINE

As a basic principle I believe we may state that the mission of the medical profession in peace, war, or time of emergency, is to provide the American people with an adequate medical service. In normal times of peace this mission is comparatively simple and generally has been fulfilled with reasonable satisfaction. (Our proponents of State Medicine will probably dissent.) In the emergency this problem has become vastly different. The armed forces, normally absorbing a small part of the population and adequately cared for by their intrinsic medical services, are now being expanded to include large numbers of individuals requiring a greatly expanded and highly specialized medical service. The industrial effort incident to rearmament has created a tremendous concentration and redistribution of labor, which under modern conditions will require a great expansion in the field of industrial medicine.

Even in the field of normal civil practice great changes may be anticipated, incident largely to shifting population. We are inclined

Read before the annual meeting of the New Mexico State Medical Society, Raton, New Mexico, May 26-28, 1941.

to ridicule or scoff at more primitive armies whose women and children ride with them on the troop trains or in their caravans. Nevertheless the world over women and children do follow the flag and reliable figures obtained during the World War show that more than one civilian settled in communities adjacent to camps for every soldier stationed at the camp. An even larger proportion may be expected to follow the older and economically more affluent industrial worker. The medical problem cannot fail to be serious. Overcrowded housing and schools, overtaxing of sanitary facilities, all these will create a demand for increased attention and increased numbers of physicians engaged in health work, while the increased number of sick in the enlarged communities will inevitably require a shifting of physicians to these growing communities. In these comments I have deliberately omitted discussion of the needs of civilian communities which might arise incident to aerial bombardment. Such a problem seems remote and would go far beyond the scope of this paper.

I have referred to the need for a large and highly specialized medical service for the armed forces. Present defense plans contemplate a standing army of 1,400,000 men and a navy which will eventually exceed 400,000. How long we must maintain such forces is problematical, perhaps for many years. In these services it is generally considered that seven medical officers are required for the services of one thousand men. Based on this figure you will see that our armed forces will require the services of 12,000 such officers. To this must be added the requirements of other government services such as the Coast Guard, Public Health, etc., requiring altogether perhaps 14,000 physicians. This figure, derived from our experience is greater than that set up by the Office of Production Management or the Committee on Medical Preparedness of the American Medical Association, but we are convinced that the figures derived from those agencies are inadequate for actual needs.

Modern war is a war of machines—airplanes, tanks, battleships—machines long in the making but destructible in the twinkling of an eye. It is not enough that we provide an initial supply adequate for the use of our armed forces. Production must continue for replacement and reserve as long as our armed effort must continue. This requires a tremendous concentration of industrial effort and a large industrial army must support the army in the field. It has been estimated recently that sixteen workers are required to provide the materials of war used by one soldier. You are all aware of the large factories, new industries being created in sections of the country where such efforts have never been carried on before. In accordance with the socializing tendency of modern society organized industrial medicine must be provided for these workers. This matter has been given most serious consideration and study in the Office of Production Management and it is estimated that five per cent of the physicians in America ,approximately 8,000, will be required for this work.

AVAILABLE RESOURCES

Let us now consider what resources we have to accomplish the prescribed task. This involves consideration of the adequacy of our own profession. Qualitatively I believe we have little basis for concern. Since 1910 the standards of medical education training and practice in this country have risen steadily so that today the general ability of our practitioners is undoubtedly higher than will be found in any other nation.

This improvement in quality has been obtained at the expense of quantity. Between 1905 and 1915 there was a ruthless extermination of the poorly equipped, commercial type of medical school and the number of medical schools in the United States was decreased from 160 to 96. By 1924 this number was further reduced to 79 since which year the number of schools has been fairly constant. In addition to this curtailment in the number of schools the number of students for each school was established on a definite quota basis. This has resulted in a strict regulation of the number of individuals who may be admitted to the ranks of the profession each year. It is this curtailment of numbers, this quantitative problem, which in the present period of national emergency gives us great concern.

Medical economists state that physicians are required in this country on the basis of one per each 750 individuals of the general population. This figure is based on studies made many years ago, before hospitals had reached their present high state of organization and while public

health activities were in their infancy, however, the increased needs for these activities are partially offset by the increased activity of individual physicians made possible by modern roads and automobile transportation. Nevertheless we must consider that in 1910 there were 135,000 physicians in the United States to care for 92,000,000 individuals, a proportion of one physician to each 681 of the population. Today, based on the 1940 census, there are 175,000 physicians to provide service for 132,000,000 people, a proportion of one physician to each 754 of the population. If we accept these figures at face value it would seem that we are not too badly off in respect to normal needs. Unfortunatetly we cannot accept the figures at face value. They must be analyzed with respect to many factors. The total number of physicians includes 20,000 individuals who are not at all or only nominally engaged in the practice of medicine. The Office of Production Management estimates that there are 155,000 physicians in active practice, one to each 850 persons. Five per cent are female physicians, not available for military purposes, although fully qualified for all other purposes in the medical mission. Primarily the figures must be analyzed with respect to age and geographical distribution.

It is generally recognized that a disproportionately great number of physicians is located in our larger cities. Thus New York (population 4,211,699) has one physician to 383 of the population; Chicago (population 3,384,556) one to 564; St. Louis (population 813,748) one to 406; San Francisco (population 629,553) one to 325; and Dallas, (population 293,306) one to 425. By contrast we have analyzed the figures for the states of the Eighth Corps Area and find that Texas (population 6,418,321) has one physician for each 930 of the population, New Mexico (population 528,687) one for each 1204, and Oklahoma (population 2,334,437) one for 992.

The factor of age among the members of our profession is a most important one. During the years of unrestricted medical education in this country a reservoir of physicians was built up which still contributes largely to the gross total of physicians. Today these men are in the upper age groups, most of them retired, or semi-retired, but still statistically listed as physicians and included in the totals of our computations.

The Office of Production Management estimates that twenty-five per cent of American physicians listed as active are over 60 years of age. For this and neighboring states the figures are still higher (Table 1.)

TABLE I

State	Population	No. Physicians	No. Over 60 Yrs.	Percentage Overage
Texas	6,418,321	6,898	2,092	30+%
New Mexico	528,687	439	152	34+%
Arizona	497,789	594	149	25+%
Oklahoma	2,329,808	2,352	917	36+%
Colorado	1,118,820	1,964	635	32+%
Total 8th C. A.	10,893,425	12,247	3,945	31+%

An additional 7,500 physicians, recent graduates are serving internships and residencies. Reasonable judgment with an eye to future needs demand that these be left untouched.

TABLE II

a.	Total No. registered physicians U. S. 1940		175,000
b.	Unavailable:		
	(1) Retired or out of pracitce*	20,000	
	(2) Interns or Residents	7,500	
	(3) Permanent Fed. Service (Army, Navy, Vets. Adm., P.H.S. I.S.)	4,500	
	(4) State Health Services (fulltime)	500	
	Total unavailable	32,500	32,500
c.	Available General Service		142,500
d.	Required, Emergency Purposes:		
	(1) Federal Services	9,500	
	(2) Industrial Medicine*	8,000	
	Total Required Emergency Purposes	17,500	17,500
e.	Available for Medical care general population		125,000
f.	Includes:		
	(1) Female physicians	8,500	
	(2) Overage physicians*	37,500	
	Limited availability	46,000	46,000
g.	Fully available		79,000

* Based on O.P.M. estimates.

We are now prepared to strike a balance (Table II) and we find that if the needs of the armed forces, government services, and industrial medicine are fully met there will be 125,000 physicians available for the general civil population of 114,000,000 people, or one physician for each 912 individuals. This number (125,000) includes all of the overage and the female physicians, whose capacities must be regarded in some respects as limited. Undoubtedly most of these will be fully efficient in the ranks of industrial, school, public health, and general medical practice. They cannot be utilized in the military service. The 125,000 must provide faculties for our schools, staffs for civil hospitals and psychiatric institutions as well as school and public health physicians required by the populace at large.

THE PROBLEM OF ADEQUATE SERVICE

From these statistics it is evident that the problem of providing an adequate medical serv-

ice for the American people in the present emergency is not a simple one. It was first presented to the American Medical Association by Lt. Colonel George Dunham of the Army Medical Corps at the 1940 convention, following which the Association organized a Committee on Medical Preparedness which worked in close co-operation with the Division of Medical Sciences of the National Research Council. As a result of the work of these committees each of us received a questionnaire used in compiling a card file for which the Association could determine our place in the scheme of things. So far, so good. If the profession is to be fully organized the first step of necessity is that some central agency know who we are, what we are, and where we are. However, when it was suggested that the American Medical Association assign physicians to prescribed tasks and locations, Dr. Fishbein, with characteristic incisiveness, asked who was the American Medical Association to tell its members where they should go and what they should do. Many other agencies have now studied the matter—The Office of Production Management, National Selective Service Headquarters, The Federal Security Agency, and others. So far the answer seems as remote as the cure for cancer. The concensus of opinion seems to be that the problem must be studied locally—within the states—for this reason I hope that your House of Delegates will consider the matter carefully. Your problem is particularly acute. Statistics indicate that already the proportion of physicians to populace in your state is very low. They indicate that your proportion of older physicians is very high. Distances are great and tasks are arduous. Even in the salubrious areas of New Mexico you cannot live and retain youthful vigor forever.

Regardless of the problems of national defense you are imminently faced with a problem of replacement and here as elsewhere this major problem must be solved. Only physicians can replace physicians. The supply is limited and, even by the expansion of our schools, cannot be enhanced for many years to come. The rate of production has been gauged by the normal needs of the country and has not taken into consideration the possibility of a national emergency. The physicians that we have are all there are and, with an inadequate replacement for normal losses, must suffice for many years to come. By increased facilities, increased hours of work, we can increase the rate of production of all material things to almost unlimited degrees. We cannot produce physicians overnight and only by increased labor and responsibility assumed by each individual in the profession can we meet the needs of this emergency.

Physicians are like President Lincoln's mules. One day a dispatch was brought to him at the White House stating that the Confederate Troops had ambushed a Federal Detachment and had killed three generals and eight mules. The President's countenance became very grave and one of his aides approached him to sympathize on the loss of his fine generals. Mr. Lincoln said, "It isn't the generals I am worrying about, I can replace them by signing three pieces of paper, but it will take eight years to replace those mules."

So it is with physicians.

BE IN EL PASO
November 19-20-21-22
!
(See Colored Insert)

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Southwestern Medical Association
El Paso County (Texas) Medical Society

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THE SILLY SEASON

Even the most serious-minded of our students enjoys a bit of slap-stick now and then. This journal, endeavoring to please constantly, is ever alert for looney contributions to the world's wit and humor. The business of trapping nonsense is almost as fascinating as baiting Republicans at election time in Texas. So, wanting to share the fun, we submit herewith a fine specimen of silly stuff caught in the great and erudite Dallas Times-Herald. The piece should be somewhat lighter going than, say, "The Etiology and Role of Essential Flatus in Boston Bean Eaters".

Just two seasons ago, newspapers over the country published the sad story of the famed American speed-skater, Everett McGowan, who had met with early illness and was confined to bed, a hopeless invalid. Pneumonia began the long illness and an overdose of sulphanilimide, one article read, had resulted in paralysis. It had not seemed so bad as that at first, McGowan said. It was just that one day his back seemed awfully stiff. Next day it was his side, then his neck. He couldn't turn his head, he walked stiff-legged. Then the weakness set in. He could not lift a book, or pull himself up from a chair.

One doctor said it was creeping paralysis, another claimed a number of Charley horses all at once; another arthritis. McGowan took all the treatments and got steadily worse. He went to the most famous specialists in the nation. They returned the verdict: The terrifying calcium ossification. It had gotten into the vertebrae and his back was slowly stiffining. He was turning to stone, this man who twenty years before captured the three top-seeded crowns on the ice at Lake Saranac, the only man to ever capture three crowns in a single season. Now he was never to walk again, let alone skate. And there was his wife, Ruth, and little daughter, Jo-Ann. The three of them had to skate to live; their act was one of whirling, lifting, stooping, it required great prowess and stamina.

In St. Louis McGowan visited an old friend, Ralph Kressler, a veterinarian; but he had the utmost respect for horse doctors. They knew about bones, the most delicate in the world, horse bones. And friend Ralph told Mac he could cure him, if he could stand it. The back was stiffening because there was no circulation. It would have to be broken, the bones shattered, then the blood would flow through them again.

The blood would pass off the excessive calcium, the stuff that made stone out of muscle and bone. If the treatment worked, McGowan would be almost as good as new again, if he could stand the pain. There was no anesthetic. The veterinarian made Mac a head-harness, hung him up like a hunk of meat on a hook, put weights on his feet, and left him for four days, long agonizing days. Soon the calcium cracked loose, McGowan's bones cracked too, but not his spirit.

Today, that same Everett McGowan, the only triple-slam speed-skating champion in history, confined to a slow death on an invalid's bed only two years ago, is the active, powerful Apache man of McGowan and Mack. He's the tough guy who carries his wife on his shoulders and slings her around.

THE SULFONAMIDES

The sulfonamides are extremely useful drugs, especially when they are correctly employed. The busy practitioner may not be able to read all the papers now appearing on this topic. It would seem to be worthwhile to sketch briefly a portion of the accepted knowledge concerning the sulfonamides now included in N. N. R.

Sulfanilamide — (p-amino-benzene sulfonamide)—is uniformly and rapidly absorbed; distributed in all body fluids. Excretion is rapid, tendency to conjugation is slight. Is useful in lymphogranuloma venereum and meningococcic

infections. Is the preferred drug in streptococcic infections.

Sulfapyridine-2 (p-amino-benzene-sulfamide) pyridine—is irregularly and often poorly absorbed; distributed in all body fluids. Excretion is slower than sulfanilamide; its tendency to conjugation is marked. Excretion is slower than sulfanilamide; its tendency to conjugation is marked. It is useful in lymphogranuloma venereum and in infections with the gonoccus, staphylococcus and streptococcus. It is the preferred drug in meningococcic and pneumococcic infections.

Sulfathiazole-2 (p-amino-benzene sulfonamide) thiazole—is uniformly and rapidly absorbed; well distributed in blood, but poorly in other body fluids. It is rapidly excreted; its tendency to conjugate is only moderate. It is useful in dysentery bacillus and meningococcic infections. It is the preferred drug in treating infections with the following: staphylococcus, pneumococcus, lymphogranuloma venereum, gonococcus and colon bacillus.

Of these drugs sulfanilamide is the most soluble in 100cc water at 37.5°C.; sulfapyridine the least. All are available from reliable pharmaceutical manufacturers in tablet form. Some firms supply them also in powder and crystal forms. Other compounds of the sulfonamide family are under investigation at present, and some will doubtless be released soon.

EL PASO MEDICAL SESSIONS

Beginning on November 19, and ending November 22, a series of 3 medical meetings will take place at Hotel Cortez, El Paso. On the first day the Southwestern Chapter of The American College of Chest Physicians will hold its annual scientific and social meeting. The following appear as speakers before this society:

Dr. Fred G. Holmes, Phoenix
Dr. Frank S. Dolley, Los Angeles
Dr. O. J. Farness, Tucson
Dr. C. W. Mills, Tucson
Dr. Thomas H. Bate, Phoenix
Dr. Orville Egbert, El Paso
Dr. Robert B. Homan, Jr., El Paso

The annual business session business session will take up late in the afternoon of November 19. That evening the annual dinner is to be held, at which time a lecture on Aviation Medicine is scheduled. There will be a round-table luncheon devoted to X-ray case studies. All members of The Southwestern Medical Association are invited to attend this entire meeting, whether or not they are Fellows of The American College of Chest Physicians.

On November 20 is registration and opening sessions of The Southwestern Medical Association. An extremely well-balanced program is offered this year. The guest speakers (seven of them) are all teachers on the faculty of Northwestern University Medical School. They bring a highly co-ordinated, excellent agenda of post-graduate instruction. Usually speakers for the Southwestern meetings are chosen at random from the entire country, but this year it was decided to request a first-class medical school to sponsor and implement the entire instruction. Northwestern University responded with hearty enthusiasm to the invitation, and is sending from the faculty several of the most brilliant of her teachers. Members of the Southwestern Medical Association will find a high grade course of post-graduate instruction awaiting them in El Paso this year. Speakers to appear:

DR. LOYAL DAVIS

Head of Department of Surgery and Professor of Neuro-Surgery

Papers on: Surgical Treatment of Essential Hypertension. Injuries of the Peripheral Nerves. Surgery of the Cranial Nerves. Round-Table Luncheon Discussion on: Craniocerebral Injuries.

DR. HARRY CULVER

Associate Professor of Urology at Northwestern University Medical School. Head of Department of Urology at Cook County Hospital, Chicago, Ill.

Papers on: Stasis as a Factor in the Chronocity of Non-Specific Upper Urinary Tract Infections. Traumatic Lesions of the Male Urethra and Bladder. Epithelial Tumors of the Urinary Bladder. Round-Table Luncheon Discussion on: Carcinoma of the Prostate Gland.

DR. KARL A. MEYER

Associate Professor of Surgery, Attending Surgeon at Cook County Hospital, Chicago, Ill.

Papers on: Surgical Considerations in Jaundice. Complication of Peptic Ulcer Requiring Surgery. Carcinoma of the Right Half of the Colon. Round-Table Luncheon Discussion on Gastric Surgery.

DR. WALTER H. NADLER

Associate Professor of Medicine.

Papers on: Liver Function Tests: Their Significance, Interpretation and Limitations. Clinical Problems in the Diagnosis and Treatment of Jaundice. The Rationale of Diabetic Management. Round-Table Luncheon Discussion on: Physiology of the Liver.

DR. JAMES P. SIMONDS

Professor and Head of Department of Pathology.

Papers on. Clinical Interpretation of the Pathological Physiology of the Liver: (1) Regulation of the Blood. Correlation of the Pathology of Coronary Occlusion with Symptoms and Treatment. Clinical Interpretation of the Pathological Physiology of the Liver (2) General Metabolism.
Clinical Interpretations of the Pathological Physiology of the Kidneys: Nephritis and Hypertension.

DR. STANLEY GIBSON

Professor of Pediatrics.

Papers on: The Differential Diagnosis of Cardiac Lesions in Childhood. Observations on Pulmonary Conditions in Childhood. The Treatment of Heart Disease in Childhood. Round-

Table Luncheon Discussion on The Problem of Heart Disease in Children.

DR. THOMAS GALLOWAY

Associate Professor of Otolaryngology. Chief of Division of Otolaryngology at Evanston Hospital, Evanston, Illinois. Attending Otolaryngologist at Cook County Hospital, Chicago, Ill.

Papers on: Deep Neck Infections and Injuries. Selective Treatment of Malignancy about the Head. Cheomotherapy in Otolaryngology. Radiotherapy in Acute Infections. Round-Table Luncheon discussion on: Chemotherapy in Otolaryngology.

Officers of The Southwestern Medical Association are as follows:

WM. H. WOOLSTON, M. D.....President
Albuquerque, N. M.

K. D. LYNCH, M. D.....1st Vice-President
El Paso, Texas

J. W. HANNET, M. D.....2nd Vice-President
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LOUIS BRECK, M. D.....Secretary-Treasurer
El Paso, Texas

C. A. THOMAS, M. D.....President-elect
Tucson, Arizona

Meeting concurrently with The Southwestern Medical Association will be The Southwestern Academy of Eye, Ear, Nose and Throat. Speakers before this group are Dr. Harry Gradle and Dr. Tom Galloway.

The complete program appears as a colored insert elsewhere in this issue.

COMMUNICATIONS

Sir:

I would appreciate it very much if you will insert in your column of coming meetings the following:

The Fourth Annual Forum on Allergy
Detroit, Michigan
January 10th and 11th, 1942

Possibly one of these days I can return the favor in one of the columns of my Ohio State Medical Journal.

With kindest regards, I am
Sincerely yours,
JONATHAN FORMAN, M. D.
Editor Ohio State Medical Journal.

Sir:

Enclosed is an erratum which we would like to have published in the next issue of your journal. It concerns an article by Drs. Lloyd H. Mousel and John S. Lundy, entitled "Some Pulmonary Problems Related to Anesthesia," which appeared in the SOUTHWESTERN MEDICINE, June, 1941, pages 166-169.

Very truly yours,
A. B. NEVLING.

NEWS

General

Fourth annual "Pay-Your-Doctor-Week" will be observed this year November 2 to 8.

Inaugurated in 1938 by California Bank in Los Angeles, observation of "Pay-Your-Doctor-Week" spread to cities throughout the country.

Primary purpose of "Pay-Your-Doctor-Week" is to pay tribute to the members of the healing profession. Recognized also is the fairly widespread tendency to "let the doctor wait" until all other bills have been paid.

"Pay-Your-Doctor-Week" was originated and is sponsored by the banking profession.

Banks sponsoring the week throughout the country call attention to the fact that funds are available to lend for the purpose of paying doctor bills.

El Paso

The Staff of the Station Hospital, Ft. Bliss, entertained the El Paso County Medical Society at the Station Hospital on September 22.

THE PROGRAM:

6:00 Assembly at Headquarters Bldg.
6:15 to 6:45 Tour of the Hospital.
6:45 to 7:30 Dinner.
7:30 Clinical Conference.

1. Thrombocytopenic Purpura, Idiopathic
   Case report—Lt. Milton Robin
   Pathological findings—Lt. G. A. Slusser
   Discussed by—Dr. Chester Awe
2. Aseptic Lymphocytic Meningitis in a case of Infantile Cerebral Palsy, Adult Form
   —Lt. Louis B. Shapiro
   Discussed by—Dr. E. A. Duncan
3. Saphenous Vein Ligation on Treatment of Varicose Veins—Lt. Milton Eisenstein
   Discussed by—Dr. J. L. Murphy
4. Gunshot Wound of the Abdomen—
   Capt. C. B. Warrenburg
   Discussed by—Dr. J. Leighton Green

The first regular meeting of the Fall season of the El Paso County Medical Society was held September 8, at the Hotel Cortez.

The program follows:

1. Modern Classification of the Obstetrical Pelvis—Dr. Jesson L. Stowe.
   Discussion by: Dr. Chas. F. Rennick and Dr. Francis A. Snidow.
2. Fracture of the Wrist: Dr. David Cameron.
   Discussion opened by Dr. Felix P. Miller.

MISCELLANY

POLIOMYELITIS SEASON BEGINS

Once again that time of year is at hand when poliomyelitis has its greatest incidence. Last year Iowa experienced one of its worst epidemics from this disease—some 1,000 cases. Ordinarily it might be expected that an area so thoroughly saturated would be relatively immune, perhaps for several years to come. Whether or not that will be the situation this year remains to be seen. Thus far the number of cases reported has been few, but it must be remembered that the peak of incidence in this part of the country falls in September and October. The chances are good that this will be a comparatively light year for poliomyelitis in Iowa.

As far as we are aware no very practical new knowledge concerning the disease has been developed during the past year, particularly knowledge of importance to the public or even to the practicing physician. Bacteriologists, research workers and public health officials on the other hand have become stirred up over the discovery of the virus in the feces of human active and abortive cases, and its demonstration in sewage many yards away from the original source. It has also been determined that certain strains of virus can be adapted for experimental study in mice. The importance of these discoveries in the eventual solution of the problem of poliomyelitis is not to be minimized, but for the present at least it must be admitted that they are of no help in prevention and treatment—the two phases of poliomyelitis of immediate concern to parents and physicians.

Unfortunately, if we are to face the facts, and face them we should, in order to avoid holding out false hopes or promises to our patients, it must be stated that as of to date no method of proved value in either prophylaxis or therapy has been demonstrated. The work with convalescent serum unquestionably should be continued on a clinical trial basis, but it must be recognized for what it is—a purely experimental and by no means proved theory. Furthermore, we believe the experiment has progressed so that only one point of debate remains—that of the possible effect of large doses of potent serum administered intravenously in the preparalytic stage of the disease. By large doses we mean 300 to 500 cubic centimeters. Some competent observers insist that serum in these amounts does exert a specific effect. Equally competent observers, on the other hand, maintain the contrary. It is certain, however, that the serum is harmless to administer, and as a source of fluid and protein, may be of nonspecific value. Under these circumstances, there is no rational alternative than to continue the experiment in properly selected cases, and with a careful unbiased evaluation of results. Administration of small doses of serum (40 to 50 cubic centimeters) intramuscularly is probably not only useless but also a waste of serum.

One final point which might be mentioned as having some possible significance in the management of poliomyelitis cases has to do with the finding, previously mentioned, of virus in human feces and in sewage. Since the epidemiology of poliomyelitis is not definitely known it is conceivable that infected sewage may play some part. If this proves to be true it would seem advisable, especially in rural areas, to practice disinfection of stools as is commonly done in typhoid fever.—*J. Iowa St. Med. Soc.*

THIS TOO SHALL PASS

In many respects the history of chiropractic repeats that of osteopathy. Very early there arose the same quarrel between the "straights" and the "mixers," between those who believed in spinal manipulation as the one and only treatment and those who, having less faith in the omnipotence of chiropractic, reached out and embraced other therapeutic measures: diet, massage, osteopathy, colonic irrigation, physiotherapy, even drugs—in short, whatever the

law allows or the chiropractor can use discreetly. Physiotherapy, especially, has been taken up by the chiropractors who show a fondness for large, benickled, mysterious-looking electrical devices, lamps of various types, etc., all of which have their attraction for patients grown jaded of the chiropractic thrust.

Since chiropractors believe that all diseases are caused by subluxated vertebrae, fundamentalist chiropractors hold that no necessity exists for making diagnosis. Confronted with a sick person, the chiropractor has only to discover by palpation or nerve tracing, the vertebrae which are out of position. These he "adjusts," and when he has returned them to the normal position, the cure will follow automatically. We do not waste valuable time," said an early catalogue of the Palmer School of Chiropractic, "in observing healthy and morbid tissue under the microscope. We do not bother with the compounding of chemicals or the analysis of secretions and excretions. Palmer School of Chiropractic students save time and money by omitting these useless studies. The chiropractor does not take the temperature, the sputum is not examined, he never taps the chest or stethoscopically listens as in auscultation . . . he never looks at the tongue . . . in fact, *he makes no diagnosis or examination.*" . . . .

The chiropractic dogma is a total misrepresentation of both the structure and function of those parts it attempts to explain. Subluxations of the vertebrae do not occur and even if they did they would not cause disease of any internal organ. Nobody has proved that chiropractors really adjust misplaced or subluxated vertebrae. —*Med. Record.*

INJURIES OF G. U. SYSTEM

1. Attention to shock is the first step in treatment of genito-urinary injuries.

2. Injuries involving the kidney, bladder, and urethra are relatively rare but serious, and always should be considered in general injuries.

3. Early diagnosis should consist of roentgenograms, urograms, cystograms, and all clinical changes should be carefully recorded.

4. Tears of renal tissue are frequently self-healing and conservatism is better than too early surgery.

Tears of the urinary bladder and urethra should have early surgery.

6. Undiagnosed and undetected extravasation of urine results in a high mortality.

7. Motor cars, which are the greatest contributors to serious injuries, need further safeguards, as well as safer drivers.—*S. G. & O.*

FUNCTIONS OF THE SEX HORMONES

Normal sex function depends upon a delicate balance between the anterior lobe of the pituitary and the gonads. The anterior lobe has at least two gonadotropic effects which are commonly ascribed to two gonadotropic hormones. One is follicle stimulating and and causes the development of graafian follicles in the ovary and influences the function of the seminiferous tubules in the testis. The other is luteinizing and is responsible for the development of the corpus luteum in the ovary and stimulates the interstitial cells of the testis to produce male sex hormone. The production of adequate quantities of sex hormone is thus dependent upon the integrity of the anterior lobe of the pituitary. The sex hormones themselves are responsible for the development of the secondary six characteristics, which *in the male,* include:

1. Development of the external genitalia.
2. Growth and function of the prostate gland.
3. Masculine distribution of hair.
4. Lowering of the pitch of the voice.
5. Normal configuration of the skeleton, with normal proportions between the trunk and extremities and between the shoulders and hips.
6. Increase in size and firmness of the muscles.
7. Normal emotional reactions.

In the female, these include:

1. Development of the external genitalia.
2. Growth and function of the uterus.
3. Development of the breasts.
4. Female distribution of hair.
5. Normal configuration of the skeleton. When normal function of the gonads is absent during the age of puberty, the trunk becomes short and the extremities long. Other skeletal proportions are affected, such as width of the pelvis and the breadth of the shoulders and chest.
6. Characteristic feminine distribution of fat.
7. Normal emotional reactions.

Any material which produces the effects of

the male sex hormone is called an androgen and any material which produces the effects of the female sex hormone is called an estrogen. Various androgenic and estrogenic materials are available, both natural and artificial. The natural androgens and estrogens both appear to be derived from cholesterol. The most potent androgenic material thus far isolated is testosterone, which is used in the form of testosterone propionate; and the most potent natural estrogen is estradiol, which is used in the form of some suitable ester such as the benzoate or the dipropionate. Both estradiol and testosterone, although recoverable from the ovary and testis respectively, are for commercial purposes made synthetically.—*R. I. Med. J.*

ANATOMIC CLASSIFICATION OF COMMON DISEASES OF THE SPINAL CORD

	White or Grey Matter	Site of Lesion	Disease Entity
Discrete	Grey	Anterior horn	Poliomyelitis
	White	Posterior columns	Tabes
	White	Pyramidal tracts	Spastic paraplegia (rare)
Combined	Grey & Grey	Anterior and posterior horns	Syringomyelia Hematomyelia
	Grey & White	Anterior horn and pyramidal tract	Amyotrophic lateral sclerosis
	White & White	Posterior and lateral columns	Posterolateral sclerosis
Diffuse	White	Anywhere	Multiple sclerosis

J. Iowa St. Med. Soc.

SYMPTOMS OF GASTRIC CARCINOMA

Gatewood

(13.9 per cent, 58 of 417 resected)

1. Pain
2. *Loss of weight*
3. *Vomiting*
4. Weakness
6. Loss of appetite
5. Indigestion and belching
6. Loss of appetite
7. Fullness
8. *Anemia*
9. Regurgitation

Oughterson

(15.8 per cent, 19 of 120 resected)

1. Abdominal discomfort
2. *Loss of weight*
3. Constipation
4. Eructation
5. Anorexia
6. *Vomiting*
7. Regurgitation
8. Diarrhea

Harris

1. Gradually increasing loss of appetite
2. Epigastric distress
3. Indefniite abdominal pain
4. A history of ulcer with change in intensification of symptoms
5. Gradual malaise and fatigue
6. A family history of cancer
7. A little loss of weight
8. *Anemia*

Lahey

(25.7 per cent, 50 of 105 resected)

1. Indigestion
2. Anorexia
3. *Pain*
4. *Weight loss*
5. *Vomiting*
6. Dysphagia
7. Weakness
8. *Hemorrhage*
9. Constipation
10. Diarrhea
11. *Mass*

Ransom and Coller

(13.4 per cent, 56 of 415 resected)

1. Epigastric pain
2. Anorexia
3. *Pain and gas*
4. *Pain and weakness*
5. *Pain and vomiting*
6. Nausea and *vomiting*
7. Stomach trouble
8. Dyspepsia
9. Gas
10. Abdominal distention and dyspnea
11. Nausea and dizziness
12. *Vomiting of blood*
13. Dysphagia
14. *Pain and tumor*
15. *Loss of weight*
16. *Vomiting* and weakness
17. Fainting and pain

—*S. G. and O.*

NEW TEST FOR DETERMINING ADEQUACY OF CONNECING VARICOSE VEINS

A test that determines within two minutes whether the branches of the veins connecting varicose veins with each other are functionally adequate is reported in *The Journal of the American Medical Association* for July 12 by Gerald H. Pratt, M.D., New York. The test is valuable in that it indicates whether and at what point a communicating vein will have to be ligated or shortened by surgically resecting part of it.

Dr. Pratt has used the test more than one thousand times and he says that in more than "three hundred resections (of these veins) it

has successfully proved its value. . . ." Briefly the test is as follows:

With the patient lying down, the leg to be tested is elevated and with light massage the veins are emptied (of blood). A tourniquet is placed sufficiently high in the thigh to close off the saphenous vein (the large vein extending from the foot to the groin). An Ace (elastic) bandage is then applied from the toes to the tourniquet. The patient then stands up and the Ace bandage is slowly unwound from above down. With the tourniquet above preventing reflux of femoral blood (blood in the thigh vein) through the saphenous valve and with the Ace bandage below compressing the remainder of the saphenous vein, a bulge or blowout indicates an incompetent communicating branch vein. Such an area is marked with an indelible pencil and is a point where a secondary ligation (the large saphenous vein is the primary ligation) will be required. In a limb in which there are many such blowouts a second Ace bandage is slowly removed, a blowout appearing between the two Ace bandages is thus a new one and must also be marked and resected.

While in most instances there are only one or two such blowouts, occasionally, the author points out, one finds four or five. Failure to remove such other blowouts results in recurrences.

THE PHYSICIAN-SOLDIER

Laments are too often heard for men who are chosen for military duty. The necessity for building military forces is evident. It is obvious duty of men who are qualified to submit willingly and heartily to military training and service. This applies to physicians as well as to selectees in the draft. In order that the Army of the United States may have full and adequate medical service it becomes the duty of physicians in considerable numbers to accept commissions in the Medical Corps. The enlisted men and officers of the line are entitled to the best medical talent and facilities that can be provided.

It is not a simple task to raise and train a great army when the country is not at war. The conflict of ideas and purposes among the population and the resulting lack of unity of feeling precludes the nation-wide emotional response. The United States is not aroused to a national emergency calling for self denial and sacrifice. It is through cold analysis of world conditions that men should be led to see the dangers ahead and the necessity to prepare to meet these dangers through the organization of national resources. Such organization means men and equipment, regiments and guns and all that goes with them, including a large number of doctors. As a special group doctors possess the intellectual qualifications to think through the cold analysis of the problem, unfettered by political influence or policy. As a part of the social organization doctors have a particularly important function to perform. Above all else they are doctors. Their duties are prescribed for them by society at large and by their own professional standards.

Historically the mission of the physician as a soldier is to keep as many men at as many guns as many days as is humanly possible. For these physicians whose duty does not take them into military service this mission should be paraphrased for the general practitioner in country or urban practice, for the industrial surgeon in a factory town, for any doctor anywhere. Those whose privilege and duty it is to serve with the armed forces will have a more colorful and a more valuable experience. Many of these men will meet and be associated with some of the best minds in medicine. For them it

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WHITHER BUSINESS?

Writing on Business in the New Era, in Forbes Magazine, James Truslow Adams winds up his article by saying in substance that the fate of business as we have known it depends on the willingness and ability of business leaders themselves to readapt themselves to social responsibilities that changing mass thought would impose upon them. To quote:

> Businessmen have not yet, at least, received a death sentence, but on the contrary a ringing challenge from the whole nation to assume leadership, and join in searching for the right answers to the questions which the President and the people, striving blunderingly to work out the final step in democracy, are asking. If they can become leaders and perform their social task, they need not worry about business, their future status or America; but if they sulk and fail, they will fall like the noblesse of old France, and perhaps carry themselves, their investors and the whole nation down with them.

To this, many conservative businessmen will reply that business can do nothing, that co-operation with the new deal is impossible because of utter incompatibility of viewpoints. This is where a large part of business leadership makes its big mistake; it assumes that it must stand still or co-operate in Roosevelt reforms. So it

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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chooses to stand still and hurl criticism at the new deal with the hope that Roosevelt's regime will eventually go under and the good old way will be resumed. Roosevelt's regime may pass—even be repudiated—but those who have stood still and criticized will be in no position to assume national leadership. "The world do move." We all admit that. Mr. Adams is urging business leadership to be constructive—to move—whether it moves parallel to the new deal or diverges from it.

In another twenty years this will be a considerably changed country. Of course, much depends on the turn of world events, but assuming an Allied victory, this country will be very largely in the hands of the young men and women who are in school and college today. These young minds are going to be influenced largely by the example set before them by advocates of conflicting theories. Business leadership must be constructive, it must offer something in the form of achievement under the new conditions if it is to be influential in molding the plastic mind of the young of today that will be the leadership of tomorrow.—*Dallas Morning News.*

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A simple method for removing the plungers of "frozen" glass syringes is suggested by Dr. Augusta B. McCoord, of the University of Rochester (N. Y.) School of Medicine and Dentistry. A syringe with a plunger smaller in diameter than that of the "frozen" syringe is filled with water. The needle is passed through a wide rubber band which acts as a gasket, and then inserted into the outlet of the "frozen" syringe. Water is forced from the smaller

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syringe into the "frozen" syringe, until the plunger of the latter is free.

It may be necessary to repeat the process several times.—*Mod. Med.*

BOOK NOTES

THE CARE OF THE AGED. (Geriatrics.) Malford W. Thewlis, M. D. The C. V. Mosby Company, St. Louis, 1941.

This is the completely rewritten, third edition of the textbook on Geriatrics which appeared in 1919. The only earlier work on the same subject was Nascher's book in 1914.

Thewlis' pioneering effort in the problem of the care of the aged has been well established. Throughout the book, the author demonstrates his deep sympathetic interest in this special field, and he frequently shows a frank desire to place his own vast knowledge of the subject at the service of the general practitioner.

The book is divided into five sections. The first section deals exclusively with the general aspects of senescence. A brief history of Geriatrics is followed by a discussion of the anatomic and physiologic changes in old age, both in health and disease. The final chapters include prolongation of life, hygiene, and economic as well as medicolegal problems of the aged. Section II, is devoted to preclinical medicine and the remaining sections to the various infectious and noninfectious diseases.

The author has made a successful attempt to cover every field of medicine in the volume. The book is well written, though there is considerable repetition in many of the chapters. The case reports are interesting and well done descriptivly. The numerous tables, illustrations and photographs have been carefully selected. Full reference to source of material together with an excellent bibliography make this book of special value.—*Walter I. Werner, M.D.*

A MANUAL OF ALLERGY: Milton B. Cohen. M. D., Director of The Asthma, Hay Fever and Allergy Foundation; Visiting Physician in Allergy, St. Alaxis Hospital, Cleveland, Ohio. 156 pp. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers. First Edition. $2.00.

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—*V. M. R.*

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1940. Cloth. Price, $1.00. Pp. 181. Chicago: American Medical Association, 1941.

This volume contains not only all of the published reports of the Council for the preceding year but also reports on products which were not deemed important enough to be published in The Journal. Council reports may be classified in general as those of omission or rejection, preliminary reports and status reports on drugs or on various therapeutic and pharmacologic problems. Representatives of all classes appear in this volume.

Noteworthy preliminary reports are on Guanidine Hydrochloride-Calco, which has been proposed for use in the treatment of myasthenia gravis, and Acetylglycarsenobenzene, a new antisyphilitic for intramuscular use, which the Council feels should be further perfected. In its report the Council comments with approval upon the manner in which the Winthrop Chemical Company has developed the latter and studied it before even considering its commercial production.

Among the nomenclature reports are those designating "Pyridoxine" and "Pyridoxine Hydrochloride" for Vitamin B_6 and Vitamin B_6 Hydrochloride; "Sulfathiazole" for 2-Sulfanilamidothiazole and "Sulfamethylthiazole" for 2-Sulfanilamido-4-Methylthiazole. Preliminary reports on these drugs as well as on Phenothiazine and Histaminase are included.

It is difficult to choose any among the so-called status reports for special mention—all are noteworthy for one reason or another. The report on the present status of the injection treatment of hernia is a continuation of the Council's consideration of this question. The Council has reached the decision that it is necessary to condemn the exploitation of the injection treatment of hernia by manufacturers of solutions.

Another status report that must be mentioned is that on Lipocaic, a new pancreatic hormone concerned in some may with the normal transport and utilization of fat. The Council awaits development of further clinical evidence for Lipocaic and expressed the opinion that the method should not be recognized for routine practice.

Mention must be made of the excellent report on organic mercurial compounds as bactericidal agents, which states the Council's conclusion that no organic mercurial compound has yet been offered that will guarantee the destruction of spores under all conditions.

Another valuable report is that on the promiscuous use of the barbiturates. This is a continuation of a previous study of the use of barbiturates in suicide. The present study is an analysis of hospital data.

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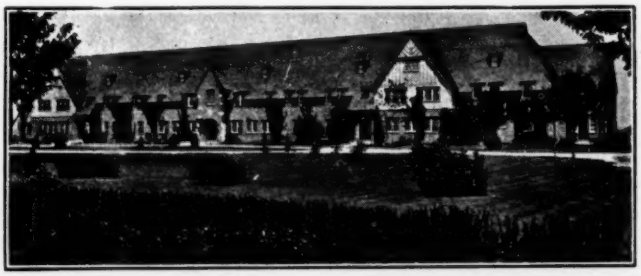

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A change in the spelling of the name "Petrolagar" to "Petrogalar" has been announced by the Petrolagar Laboratories. The change is being made in both the product name and corporate name.

Company officials, while pointing out the adoption of the new spelling does not affect the formula or quality of the product in any way, said that they considered the change advisable to avoid any possible misconception as to the nature of the product.

"Because it has never been the intention of the company to imply that agar-agar was used for any other purpose than as an emulsifying agent, the last syllable of the former name has been altered in favor of the new spelling", officials said.

Officials emphasized that no change has been made in the size of the package, price, or formulae and that each of the five different types of the product will carry the new spelling "Petrogalar". The new corporate name is: Petrogalar Laboratories, Inc., and the address remains, 8134 McCormick Boulevard, Chicago, Illinois.

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